

Re-print

Work Order ID 83699

May 29, 2012 7:57:21 AM

83699

Page 1

Item ID: D350-748-201

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Installation, High Aft

Stop

NS2

Start Date: 4/23/12 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 5/07/12 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: CD

Date: 12/05/29 Tooling:

Date:

Run Start

NR1

QC:

Date: SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr Revision Nbr

D350-748-241 F

SD

0.00

100

100

DOCUMENT CONTROL

DC

Document Control

Memo

0.00

Photocopy bluefile & type labels per PPPD350-748-201

CHG002

110

110

CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

0.00

Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT

[Signature]

12-5-10

120

120

QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

S 12-5-10

Memo

0.00

Issue P/O to Metcor P/O : 16942 Cal 12/10/04

12-5-10

Rec'd inspect attached c ofc to w/o

[Signature]

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: NC Closed: _____ Date: _____

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Stop

NS2

Start Date: 4/23/12 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/07/12 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

130

Crosstubes

Crosstubes

0.00

Memo

0.00

1-Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-241

4-Remove all marks from tube within limits of D350-748-241

5- Apply a light coat of LPS3 on the interior of tube

Batch: W78

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Quality Control

Memo

0.00

5/20/13

MO

12-5-23

W/O:		WORK ORDER CHANGES						
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 *150* Outsource3	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							<i>CL 12/06/09 01</i>
150 Outsource3	Memo Issue P/O: <i>17089</i> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached	0.00							
160 *160* Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs	0.00							<i>R. R. F. M. O.</i>
	Memo Ensure certificate of conformity is attached	0.00							<i>* SER W/ O/C & ATTACHED</i>
170 *170* QC Quality Control	QC5- Inspect part completeness to step on W/O	0.00							<i>S. J. L. 12/06/09</i>
	Memo	0.00							<i>SOLOMONS</i>

WDT

P/O: 17258

CL 12/06/09 X1

need

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.10.19	161	LOAD TUBE TO 3000 ¹⁵ FOR 1 MINUTE REF D.S. EMAIL		JP 11/6/19	1	JP 11/6/19	
11.10.19	162	NDT TUBE					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

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Cust Item ID:

Required Date: 5/07/12 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* QC	QC5- Inspect part completeness to step on W/O Quality Control	0.00				1			12/06/24
220 *220* Packaging	Pick Kit Packaging	0.00							12/06/25 SF
230 *230* QC	QC4- 100% Inspect kits for completeness Quality Control	0.00				1			12/06/25

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Setup

Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Installation, High Aft

Start Date: 4/23/12 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/07/12 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

240

240

Packaging

Packaging

0.00

(X)

SP
12-6-28

Packaging

Memo

0.00

Identify and pack for shipping as per PPPD350-748-201

Location:

PPP Rev:

250

250

QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

MW 12/06/26

Memo

0.00

MJ 12/06/26

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

May 29, 2012 7:57:20 AM

Page 1

Work Order ID: 83699

Parent Item: D350-748-201

Start Date: 4/23/12

Required Date: 5/07/12

Parent Item Name: Crosstube Installation, High Aft

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev: A New Issue 06-07-05 JLM

IPP Rev: B Update qty of MS21042L5 06-09-12 KJ

IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD

IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC

IPP Rev:E 08.12.11 Step17 was step 21 KJ Verified by:EC IPP Rev:F 10.08.04 added QSI010

4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-241TRN		Manufactured	No			110	Each	2.0000	1	1			

Crosstube Turning Detail

Location	Loc Qty	Loc Code
LG 73375	2	
61314	0	
61315	0	
79393	1	
83287	1	

1 JW 12-5-10

ALS4-1032-225

Insert

Purchased No 200 Each 855.0000

Location	Loc Qty	Loc Code
ST281 118520	832	
108696	146	
110768	62	
118386	55	
118966	68	
121269	501	
ST282	23	
120410	10	
120451	13	

① AS 12-6-22

AN960JD10

NAS1149D0363J Purchased

No

121524 200 Each 0.0000

Washer

① AF 12-6-22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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May 29, 2012 7:57:20 AM

Page 2

Work Order ID: 83699

Parent Item: D350-748-201

Start Date: 4/23/12

Required Date: 5/07/12

Parent Item Name: Crosstube Installation, High Aft

Start Qty: 1.00

Required Qty: 1.00

D2856-400

Manufactured No

200 f 254.5445 1.181 1.2431579 AF 12-6-22

Abrasion Strip

1-cut as per dwg D2856

Location Loc Qty Loc Code

ST403 216

81875 216

ST409 38.5445

63735 0.6696

68076 0.3149

71164 8.46

79551 29.1

(1)

D3502-1

Support

Manufactured No

200 Each 21.0000

2 2 AF 12-6-22

77041

Location Loc Qty Loc Code

ST051 21

73419 11

74873 10

(2)

MS21920-20

Clamp (per MIL-DTL-8783C)

Purchased No

200 Each 86.0000

2 AF 12-6-22

Location Loc Qty Loc Code

LG050 86

116799 8

120676 8

121067 20

121274 50

(2)

MS27039-1-10

Screw

Purchased No

200 Each 126.0000

1 AF 12-6-22

122027

Location Loc Qty Loc Code

GA 100

120449 100

ST291 26

120120 26

(1)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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May 29, 2012 7:57:21 AM

Work Order ID: 83699

Parent Item: D350-748-201

Start Date: 4/23/12

Required Date: 5/07/12

Parent Item Name: Crosstube Installation, High Aft

Start Qty: 1.00

Required Qty: 1.00

AN4-41A

Purchased

No

220

Each

539.0000

8

8

SD

Bolt

Location	Loc Qty	Loc Code
360	181	
121185	181	
ST360	358	
115108	3	
115705	7	
118451	29	
<u>118838</u>	50	
119328	100	
120423	150	
121205	15	
121573	4	

AN4-6A

Purchased

No

220

Each

1,514.0000

16

16

SD

Bolt

Location	Loc Qty	Loc Code
355	222	
121631	222	
ST356	1292	
<u>119017</u>	792	
121243	500	

AN5-32A

Purchased

No

220

Each

245.0000

4

4

12-6-25 SD

Bolt

Location	Loc Qty	Loc Code
ST339	145	
<u>119862</u>	50	
<u>120423</u>	75	
120910	20	
ST340	100	
121541	100	

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Required Date: 5/07/12

Parent Item Name: Crosstube Installation, High Aft

Start Qty: 1.00

Required Qty: 1.00

AN960JD416 NAS1149D0463J Purchased No

220 Each 30.0000

32

32

Washer

M101912

	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
--	-----------------	----------------	-----------------

ST351	30	
116289	10	
119097	20	

AN960JD516

NAS1149D0563J Purchased No

220 Each 0.0000

8

Washer

m101954650

D3500-1

Manufactured No

220 Each 75.0000

4

Saddle

450

	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
--	-----------------	----------------	-----------------

ST423	14	
78595	14	
ST424	31	
73405	20	
73406	8	
76000	3	
ST425	30	
76940	30	

4

D3501-1

Manufactured No

220 Each 367.0000

16

Bushing

B054450

	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
--	-----------------	----------------	-----------------

ST051	367	
67757	4	
73391	6	
74866	207	
77033	61	
81955	26	
83253	63	

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Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 4/23/12

Required Date: 5/07/12

MS21042L4

Purchased

No

220

Each

4,226.0000

24

24

Nut

Location	Loc Qty	Loc Code
ST300	4226	
119075	125	
121011	844	
121444	2957	24
121652	300	

MS21042L5

Purchased

No

220

Each

1,469.0000

4

4

Nut

Location	Loc Qty	Loc Code
300	500	
121652	500	
ST300	969	
108827	8	
116105	5	
116548	43	
117611	18	
119109	887	4
17651	8	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

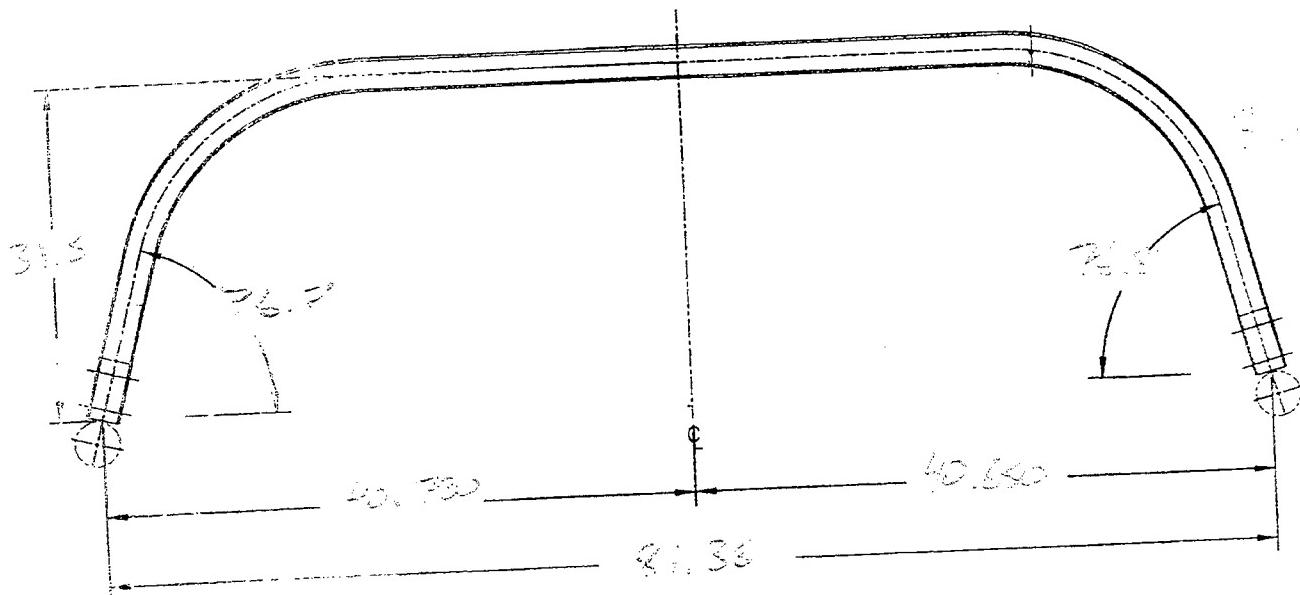
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	53609
Description: Crosstube High Aft (AS350/355)	Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: E		Page 1 of 1

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments	
Twist = 0.00	
Locate Points 81.36	
QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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DART AEROSPACE LTD

Work Order:

83649

Part Number:

D350-748-201

Page 1 of 1

Description: Crosstube High Aft (AS350/355)

Inspection Dwg: D350-748-241

Rev: E

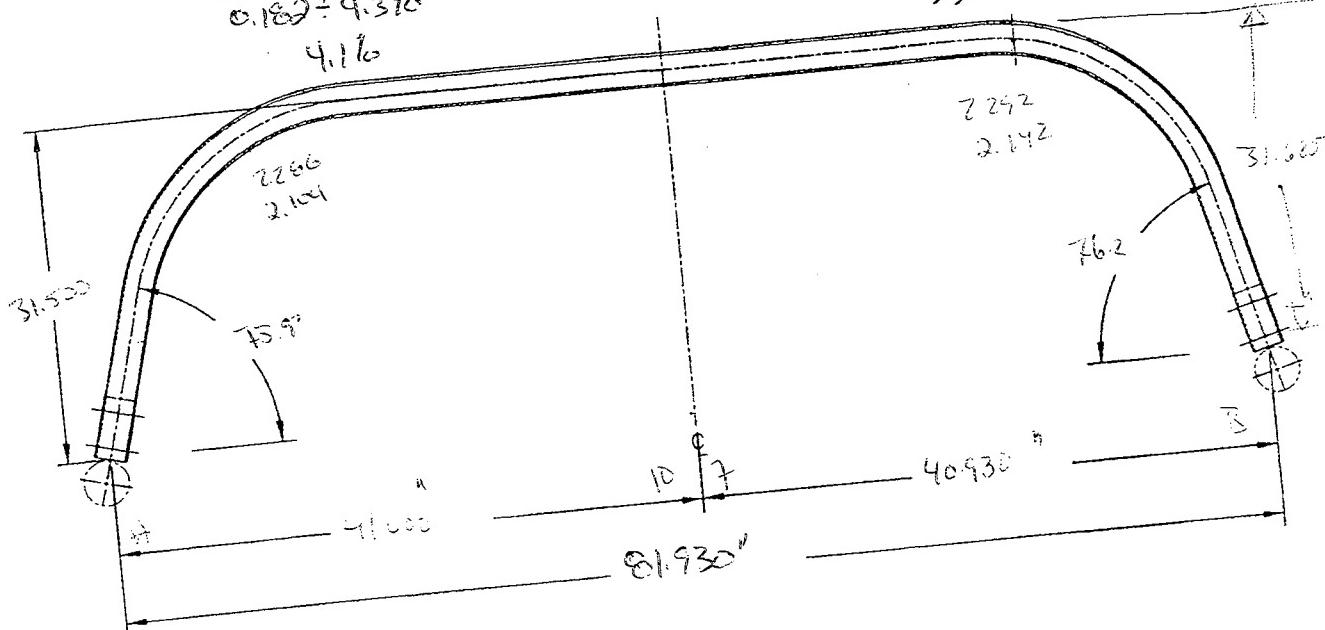
Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06

0.182 ± 4.390

4.16

0.182 ± 4.434

3.36



Comments

SIDE A = 4.1% crushing @ 10 passus
 SIDE B = 3.3% crushing @ 7 passus
 twist = 0.45°
 tube is kinked

(X) if n.s.w. 2.00

QC15 Inspection

Date

6

17/05/16

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	J

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

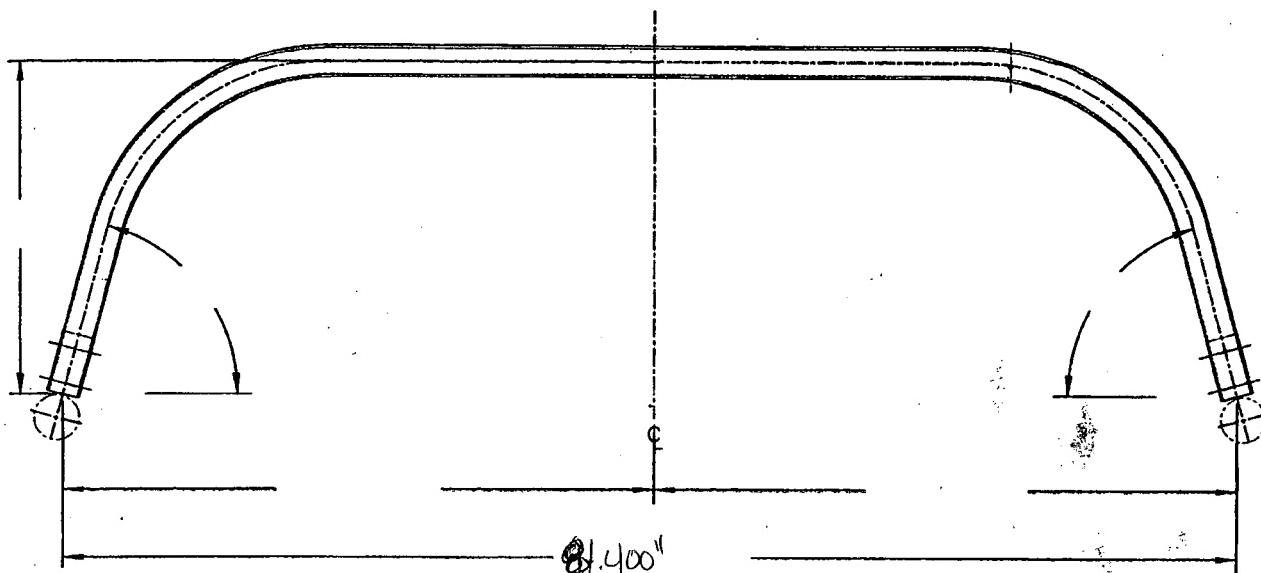
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:
Description: Crosstube High Aft (AS350/355)	Part Number: D350-748-201
Inspection Dwg: D350-748-241 Rev: E	Page 1 of 1

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06

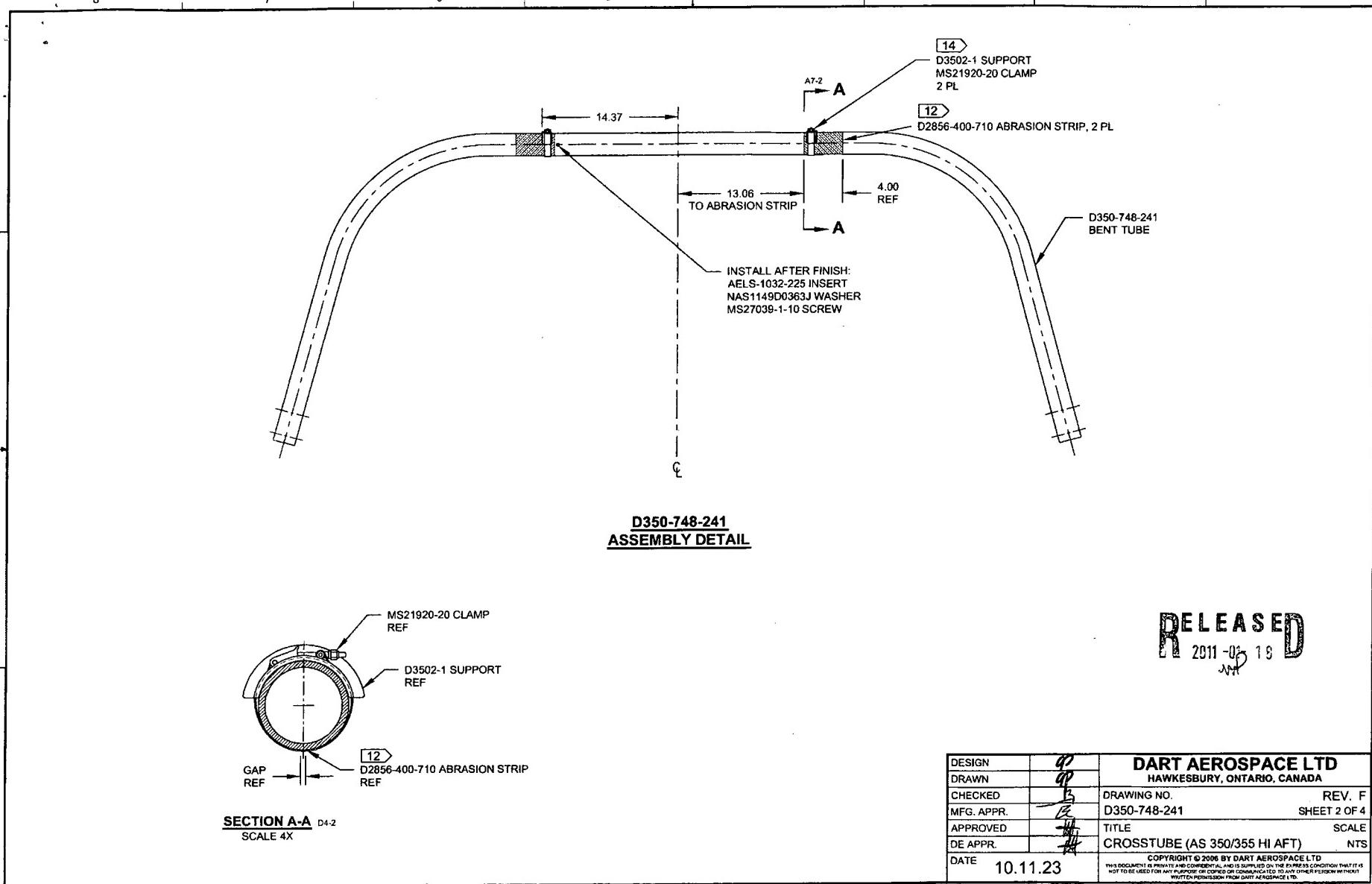


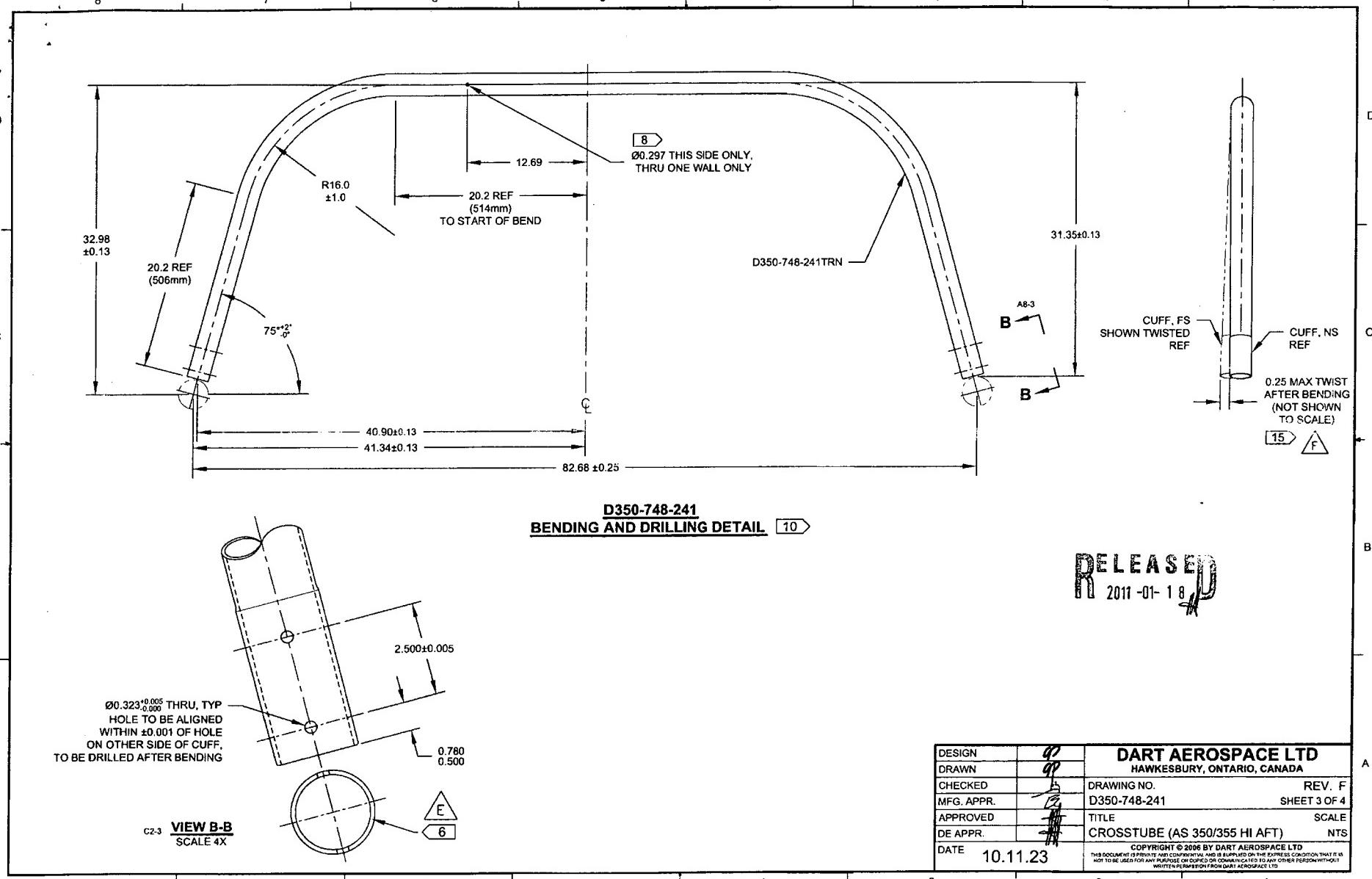
Comments
Twist ~ 0.05"

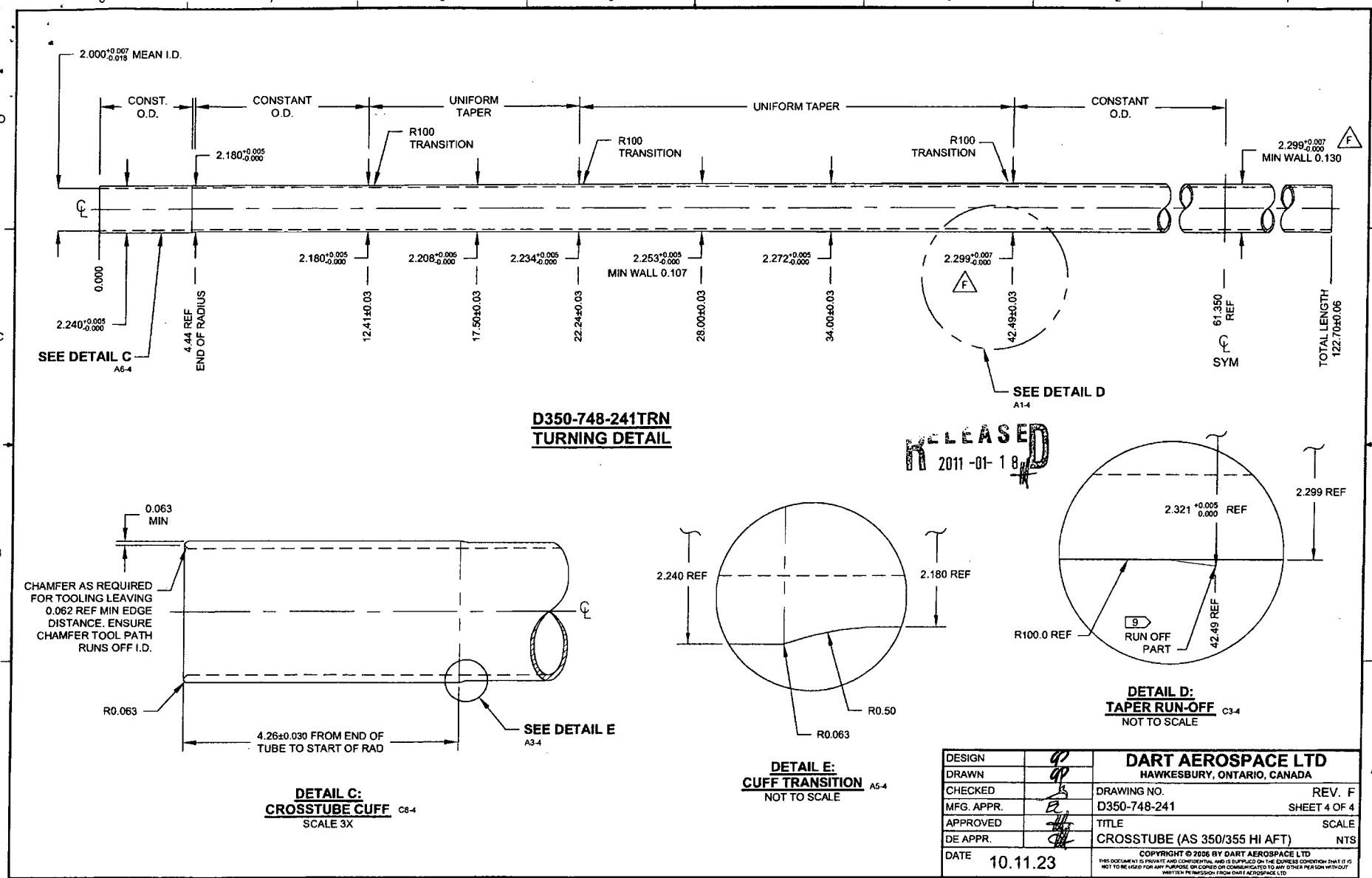
QC15 Inspection
Date

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	J

8	7	6	5	4	3	2	1																																																								
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<p><u>GENERAL NOTES:</u></p> <p>1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125 FINISHED LENGTH = 122.700±0.06</p> <p>2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2 CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2</p> <p>3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.</p> <p>4) UNITS: INCHES UNLESS OTHERWISE NOTED.</p> <p>5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.</p> <p>6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)</p> <p>7) WEIGHT: 29.85 lbs</p> <p>8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.</p> <p>9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.</p> <p>10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.</p> <p>11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.</p> <p>12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.</p> <p>13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.</p> <p>14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED OUT AFTER TORQUING.</p> <p>15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).</p>																																																															
B F							B																																																								
<p style="margin-left: 100px;"><i>CD 12/05/29</i></p> <p style="margin-left: 100px;"><i>WTO: 83699</i></p> <p style="text-align: right; margin-right: 100px;"><i>RELEASED</i> 2011-01-09 <i>M</i></p>																																																															
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METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détailé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175881	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
16942		Steel		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

SAE AMS 2759/1 REV.E

EXIGENCE / requirement	SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
Visual		

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
	210	D350-748-101 (1) CROSSTUBE
		(1) D350-748-101 CROSSTUBE
		(1) D350-748-201 CROSS TUBE
		CONTENANT: 1 PALETTE

Opération Operation	Temp. spécifiée Specified Temp	Temps de trempe Spécifié Specified Soak Temp	Atmosphère Atmosphere	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1,00 CONT. INIT.	LAVAGE	si nécessaire								

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Opération	Temp. spécifiée Specified Temp	Temps de trempe Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
2,00 COMPTAGE PREPARING										
3,00 STRESS RE	850	2 hrs 30 minutes	air			701				
4,00 FINAL INSP							05-11-2012			05-11-2012

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPEMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

APPROUVÉ par / Approved by:



DATE: 2012-05-11

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client./We certify that all the information on this report is exact and in accordance with the order requirements.

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jun-12-2012

CONSIGNMENT TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 114960
INVOICE #: 60875

CONTRACT OR
PURCHASE ORDER # PO17084

DESCRIPTION: CROSSTUBE

P/N # D350-748-201

QTY

1

S/N # 83699

STRESS RELIEVE HEAT CHART # 12-546. MPI-IAW ASTM-E-1444.
CADMIUM PLATE IAW AMS-QQP-416C TYPE 2 YELLOW CLASS.
BAKE HEAT CHART # 12-573. MPI IAW ASTM-E1444.

S.126/115

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:

[Signature]
CAI
08



LIQUID PENETRANT TEST REPORT

P- 12188

CLIENT
ATTENTION
ADDRESS
PROJECT
ITEM(S) EXAMINED

Dart Aerospace
MATT/LINDA
1270 ABERDEEN ST.
Hawkesbury, ONT

DATE
ACUREN JOB NO.
PO/WO NO.
WORK LOCATION
ACCEPTANCE STD.

June 19/2012 TIME
190-12-00.265 AM PM

17084

SAWE

ASTM 1417/681038 REV./DATE 2005

F.P.I. on cross tubes

(10) Pcs

SEE RESULTS

JOB DESCRIPTION PROCEDURE NO. LT 002 REV./DATE 2008 TECHNIQUE NO. LT 002 REV./DATE 2008
PART N SEE RESULTS MATERIAL 4130 STEEL THICKNESS Various
SCOPE + WET FLUORESCENT LIQUID PENETRANT EXAMINATION
AS COMPLETED 100% ON EXTERNAL SURFACE

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFI
FAMILY BRAND	MAGNAFLUX		BLACK LIGHT S/N 16459	OUTPUT > 1000 μW/cm²	<input type="checkbox"/> AMBIENT < 2 °C
PENETRANT	ZL607	MINIMUM DWELL TIME 45 ¹⁰ MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURF.	
PENETRANT REMOVER	H ₂ O	MINIMUM DRY TIME >10 MIN.	OTHER LAB NO		
DEVELOPER	SKD 52	MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N 1098866	CAL DUE DATE	July 30-2012
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F		<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F

RESULTS- METRIC IMPERIAL

W.O.#s - CROSS TUBES.

1	-	-	-	83701
1	-	-	-	836 99
1	-	-	-	836 98
1	-	-	-	815 17
1	-	-	-	815 19
1	-	-	-	843 80

12-06-19

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as to representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as to representations or warranties. Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, express or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

Matthew Murdoch

SIGNATURE

DTR # E 6350

TECHNICIAN (SIGNATURE):

Mike Lethbridge

NAME (PRINT):

1ST TECHNICIAN
CGSB LEVEL _____
CGSB REG. NO. _____2ND TECHNICIANCGSB LEVEL _____
CGSB REG. NO. _____REPORT
REVIEWED BY:

NAME

CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY